Deber 1Q
Estatica

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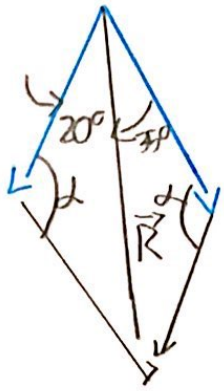
1) $P = 75N$

$Q = 125N$

$\vec{R} = \vec{a} + \vec{b}$

$360^\circ - 2(55) = 250^\circ$

$\alpha = 125^\circ$



$R^2 = P^2 + Q^2 - 2PQ\cos\alpha$

$R = \sqrt{75^2 + 1250 - 2(75)(125)\cos 125}$

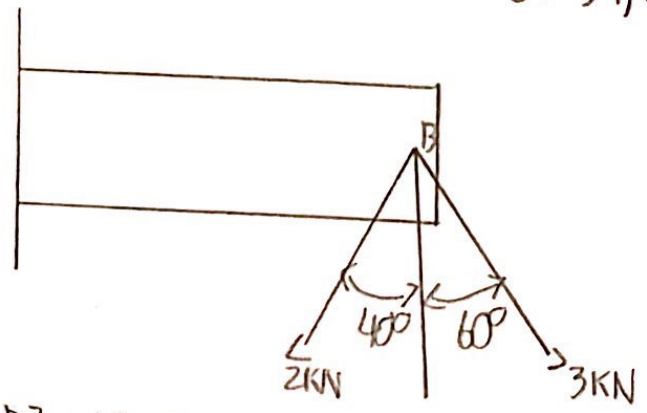
$R = 178,89N$

$\frac{\text{sen}A}{Q} = \frac{\text{sen}B}{R}$

$\text{sen}A = \frac{Q\,\text{sen}B}{R}$

$\theta = 34,75^\circ$

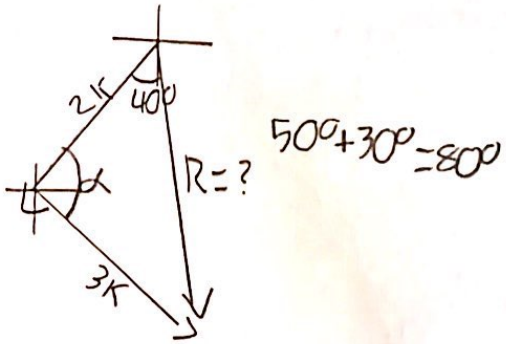
4)



$R^2 = A^2 + B^2 - 2AB\cos\alpha$

$R = \sqrt{9+4-2(3)(2)\cos 80}$

$R = 3,58N$



$50^\circ + 30^\circ = 80^\circ$

$\frac{\text{sen}A}{Q} = \frac{\text{sen}B}{R}$

$\text{sen}A = \frac{Q\,\text{sen}B}{R}$

$\theta = 55,58^\circ$

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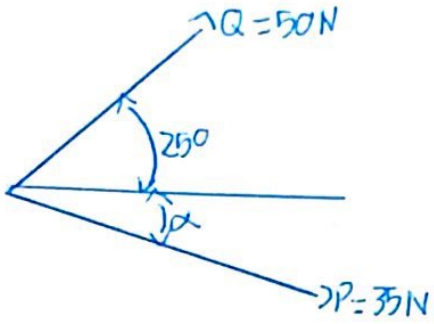
7)



$$\frac{50}{\operatorname{sen}\alpha} = \frac{35}{\operatorname{sen}25}$$

$$\frac{50\operatorname{sen}25}{35} = \operatorname{sen}\alpha$$

$$\alpha = 37,13°$$

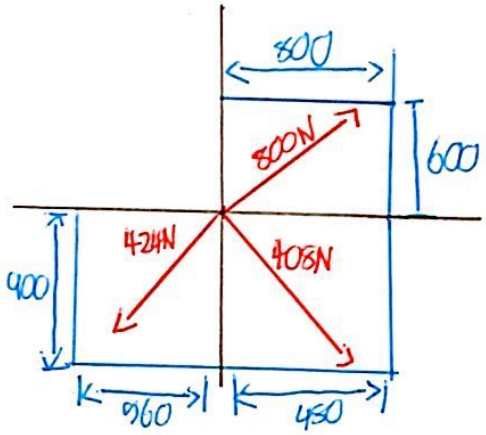
$$\alpha + \beta + 25° = 180$$

$$\beta = 117,86°$$

$$\frac{R}{\operatorname{sen}117,86} = \frac{35}{\operatorname{sen}25}$$

$$R = 73,21N$$

21)



$$OA = \sqrt{800^2 + 600^2} = 1000mm$$

$$OB = \sqrt{900^2 + 480^2} = 1020mm$$

$$OC = \sqrt{900^2 + 560^2} = 1060mm$$

$$Fx = F\cos\alpha$$

$$Fx = 800\left(\frac{800}{1000}\right) = 640N$$

$$Fy = F\operatorname{sen}\alpha$$

$$Fy = 800\left(\frac{600}{1000}\right) = 480N$$

$$Fx = F\cos\theta$$

$$= 408\left(\frac{480}{1020}\right) \Rightarrow 192N$$

$$Fy = F\operatorname{sen}\theta$$

$$= 408\left(\frac{900}{1020}\right) \Rightarrow 360N$$

$$Fx = F\cos\beta$$

$$Fx = -424\left(\frac{560}{1060}\right) \Rightarrow -224N$$

$$Fy = F\operatorname{sen}\beta$$

$$= -424\left(\frac{900}{1060}\right) \Rightarrow -360N$$

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85) A (0,90,0)
B (-45,0,30)
C (38,0,65)
D (20,0,-60)

$\overrightarrow{AB} = \langle -45, -90, 30 \rangle \Rightarrow |\overrightarrow{AB}| = 105\ ft$

$\overrightarrow{AC} = \langle 38, -90, 65 \rangle \Rightarrow |\overrightarrow{AC}| = 115\ ft$

$\overrightarrow{AD} = \langle 20, -90, -60 \rangle = |\overrightarrow{AD}| = 110\ ft$

$T_{AB} = \frac{630\ lb}{105\ ft} \langle -45, -90, 30 \rangle \Rightarrow \langle -270, -540, 180 \rangle\ lb$

$T_{AC} = \frac{T_{AC}}{115\ ft} \langle 38, -90, 65 \rangle\ ft = \langle 0,26, 0,78, 0,57 \rangle T_{AC}$

$T_{AD} = \frac{T_{AD}}{110\ ft} \langle 20, -90, -60 \rangle = \langle 0,18, -0,82, -0,55 \rangle T_{AD}$

$\Sigma F_x = 0$

$-240\ lb + 0,26\ T_{AC} + 0,18\ T_{AD} = 0$

$\Sigma F_y = 0$

$-540\ lb - 0,78\ T_{AC} - 0,82\ T_{AD} + P = 0$

$\Sigma F_z = 0$

$180 + 0,57\ T_{AC} - 0,55\ T_{AD} = 0$

$T_{AC} = 472,76\ lb$

$T_{AD} = 817,18\ lb$

$P = 1578,8\ lb$

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86) $\overrightarrow{DA} = \langle 20, 100, 70 \rangle$ ft

$|DA| = \sqrt{20^2 + 100^2 + 70^2}$

$|DA| = 126$ ft

$F = \frac{\overrightarrow{DA}}{DA}$

$F = \frac{315 \text{ lb}}{126 \text{ ft}} \langle 20, 100, 70 \rangle$

$F = \langle 50, 250, 185 \rangle$ lb

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